

WHAT IS CLAIMED IS:

1. A method of screening for compounds that reduce the bone deteriorating effects of glucocorticoids, comprising the steps
5 of:

(a) contacting osteoblast and osteocyte cells with either a glucocorticoid alone or said glucocorticoid in combination with a test compound; and

(b) comparing the number of osteoblast and osteocyte
10 cells undergoing apoptosis following treatment with said glucocorticoid alone or following treatment with said glucocorticoid in combination with said test compound, wherein a lower number of apoptotic cells following treatment with said glucocorticoid in combination with said test compound than with said glucocorticoid
15 alone indicates that the test compound reduces the bone deteriorating effects of said glucocorticoid.

2. The method of claim 1, wherein said contacting is selected from the group consisting of *in vitro* cell cultures and *in vivo* murine animal model.

5 3. The method of claim 1, wherein determination of said apoptosis is selected from the group consisting of TUNEL, DNA fragmentation and immunohistochemical analysis.

10 4. The method of claim 1, wherein said test compound has little effect on the anti-inflammatory properties of said glucocorticoid, further comprising the step of:

(c) comparing the anti-inflammatory response of said glucocorticoid in combination with said test compound to the anti-inflammatory response of said glucocorticoid alone, wherein essentially equivalent anti-inflammatory responses of said glucocorticoid alone and said glucocorticoid in combination with said test compound indicates that the test compound both reduces the bone deteriorating effects while retaining the anti-inflammatory properties of said glucocorticoid.

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5. The method of claim 4, wherein said contacting is in an *in vivo* murine animal model.

6. The method of claim 4, wherein said anti-inflammatory response is determined by models of inflammation selected from the group consisting of the adjuvant-induced arthritis model and hindlimb inflammation model.

7. A method of screening for glucocorticoid analogs that possess decreased apoptotic properties towards osteoblast and osteocyte cells, comprising the steps of:

(a) contacting said cells with either a glucocorticoid or a glucocorticoid analog; and

(b) comparing the number of apoptotic cells following treatment with said glucocorticoid or said glucocorticoid analog, wherein a lower number of apoptotic cells following treatment with said glucocorticoid analog than with said glucocorticoid is indicative of a glucocorticoid analog that possesses decreased apoptotic properties towards said cells.

8. The method of claim 7, wherein said contacting is selected from the group consisting of *in vitro* cell cultures and *in vivo* murine animal model.

5 9. The method of claim 7, wherein determination of said apoptosis is selected from the group consisting of TUNEL, DNA fragmentation and immunohistochemical analysis.

10 10. The method of claim 7, wherein said glucocorticoid analog retains anti-inflammatory properties, further comprising the step of:

comparing the anti-inflammatory response of said glucocorticoid in combination with a test compound to the anti-inflammatory response of said glucocorticoid alone, wherein essentially
15 equivalent anti-inflammatory responses of said glucocorticoid alone and said glucocorticoid in combination with said test compound indicates that the glucocorticoid analog possesses decreased apoptotic properties while retaining anti-inflammatory properties.

11. The method of claim 10, wherein said contacting is in an *in vivo* murine animal model.

5 12. The method of claim 11, wherein said anti-inflammatory response is determined by models of inflammation selected from the group consisting of the adjuvant-induced arthritis model and hindlimb inflammation model.

10 13. A method of screening for compounds that stimulate bone development, comprising the steps of:

 (a) contacting osteoblast and osteocyte cells with either a glucocorticoid or a test compound; and

 (b) comparing the number of said cells undergoing
15 apoptosis following treatment with said glucocorticoid and said test compound, wherein a lower number of apoptotic cells following treatment with said test compound than with said glucocorticoid is indicative of a compound that stimulates bone development.

14. The method of claim 13, wherein said contacting is selected from the group consisting of *in vitro* cell cultures and *in vivo* murine animal model.

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15. The method of claim 13, wherein determination of said apoptosis is selected from the group consisting of TUNEL, DNA fragmentation and immunohistochemical analysis.

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16. A method of screening for compounds that increase bone mineral density, comprising the steps of:

(a) contacting osteoblast and osteocyte cells with either a glucocorticoid or a test compound; and

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(b) comparing the number of said cells undergoing apoptosis following treatment with said glucocorticoid and said test compound, wherein a lower number of apoptotic cells following treatment with said test compound than with said glucocorticoid is indicative of a test compound that increases bone mineral density.

17. The method of claim 16, wherein said contacting is selected from the group consisting of *in vitro* cell cultures and *in vivo* murine animal model.

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18. The method of claim 16, wherein determination of said apoptosis is selected from the group consisting of TUNEL, DNA fragmentation and immunohistochemical analysis.